

**ONKYO SERVICE MANUAL****QUARTZ SYNTHESIZED  
TUNER AMPLIFIER  
MODEL TX-822****Black model**

BHUD, BHUDN	120V AC, 60Hz
·BHUG	220V AC, 50Hz
BHUQA, BHUQB	240V AC, 50Hz
BHUW	120 or 220V AC, 50/60Hz

**ONKYO  
AUDIO COMPONENTS**

# SPECIFICATIONS

## AMPLIFIER SECTION

Power output:	40 watts (50 watts : only 120V model) per channel, min, RMS, at 8 ohms, both channels driven, from 40Hz to 20kHz, with no more than 0.3% total harmonic distortion.
Musical Power Output:	2 × 95 watts at 4 ohms, 1kHz (DIN)
	2 × 68 watts at 8 ohms, 1kHz (DIN)
Continuous Power Output:	2 × 50 watts at 4 ohms, 1kHz (DIN)
	2 × 45 watts at 8 ohms, 1kHz (DIN)
Total Harmonic Distortion:	0.3% at rated power
	0.1% at 30 watts output
IM Distortion:	0.3% at rated power
	0.1% at 30 watts output
Damping Factor:	35 at 8 ohms
Frequency Response:	20 – 30,000Hz ±1dB
RIAA Deviation:	20 – 20,000Hz ±0.8dB
Sensitivity and Impedance:	Phono: 2.5mV/50 kohms CD: 150mV/50 kohms Tape Play: 150mV/50 kohms Tape Rec: 150mV/3.5 kohms
Phono Overload (MM):	120mV RMS at 1kHz, 0.3% THD.
Signal-to-Noise Ratio:	Phono: 80dB (at 5 mV input, A weighted) CD/Tape: 100dB (IHF-A)
Tone controls:	Bass: ±10dB at 100Hz Treble: ±10dB at 10kHz
Muting	– ∞

## TUNER SECTION

<b>FM:</b>		<b>-220V/240V/ Worldwide models-</b>	<b>-120V model-</b>
Tuning Range:		87.50 – 108.00MHz (50kHz steps) 87.50 – 108.00MHz (50kHz steps) or (100kHz steps) (Worldwide model)	87.5 – 108.0MHz (100kHz steps)
Usable Sensitivity:	Mono: 12.4dBf, 1.2μV, 75ohms 1.2μV (S/N 26dB, 40kHz Devi.) 75ohms DIN	Stereo: 19.2dBf, 2.5μV, 75ohms 25μV (S/N 46dB, 40kHz Devi.) 75ohms DIN	Mono: 12.4dBf, 2.3μV Stereo: 18.2dBf, 4.5μV
50dB Quieting Sensitivity:	Mono: 18.2dBf, 2.2μV, 75ohms Stereo: 38.2dBf, 22μV, 75ohms	1.5dB	Mono: 18.2dBf, 4.5μV Stereo: 38.2dBf, 45μV
Capture Ratio:	85dB	40dB	
Image Rejection Ratio:	90dB	90dB	
IF Rejection Ratio:	Mono: 70dB Stereo: 65dB	Mono: 70dB Stereo: 65dB	
Signal-to-Noise Ratio:			
Alternate Channel Attenuation:		55dB	
Selectivity:	50dB DIN (±300kHz, 40kHz dev.)		
AM suppression Ratio:	50dB	50dB	
Harmonic Distortion:	Mono: 0.15% Stereo: 0.30%	Mono: 0.15% Stereo: 0.30%	
Frequency Response:	30 – 15,000Hz ±1.5dB	30 – 15,000Hz ±1.5dB	
Stereo Separation:	40dB at 1kHz 30dB at 100 – 10,000Hz	40dB at 1kHz 30dB at 100 – 10,000Hz	
Muting Level:	17.2dBf, 4μV	17.2dBf, 4μV	
<b>AM:</b>			
Tuning Range:	522 – 1611kHz ( 9kHz steps) 522 – 1611kHz ( 9kHz steps) or 530 – 1710kHz (10kHz steps) (Worldwide model)	530 – 1710kHz (10kHz steps)	
Usable Sensitivity:	30μV	30μV	
Image Rejection Ratio:	40dB	40dB	
IF Rejection Ratio:	40dB	40dB	
Signal-to-Noise Ratio:	40dB	40dB	
Harmonic Distortion:	0.8%	0.8%	
<b>GENERAL</b>			
Dimensions (W × H × D):	435 × 115 × 320mm 17-1/8" × 4-1/2" × 12-9/16"		
Weight:	6.7kg., 14.8lbs.		

**REMOTE CONTROL TRANSMITTER RC-148S/RC-144S**

Transmitter: Infrared  
 Signal range: Approx. 5 meters (16ft.4")  
 Power supply: TWO "AA" batteries (1.5V × 2)

**Specifications and features are subject to change without notice.**

## SERVICE PROCEDURES

### 1.Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

D (120V) model

Circuit no.	Part no.	Description
F901	252049	4A(ST-6),Primary
G (220V) and Q (240V) models		
Circuit no.	Part no.	Description
F902	252074	2A-SE-EAK,Primary
W (Worldwide) model		
Circuit no.	Part no.	Description
F901	252049	4A(ST-6),Primary
F902	252074	2A-SE-EAK,Primary

### 2.Safety-check out

(Only U.S.A. model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power supply cord and nickel screw on the back panel.

Specifications: 3.3Mohm ±10% at 500V.

### 3.Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

### 4.Step band selector switch

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 50kHz (FM) and 9kHz (AM) at the factory, but may have to be reset to 100kHz and 10kHz depending on the area where the unit is used.

De-emphasis	FM step	AM step
Europe: 50μsec	50kHz	9kHz
U.S.A.: 75μsec	100kHz	10kHz

### 5.Changing the band step

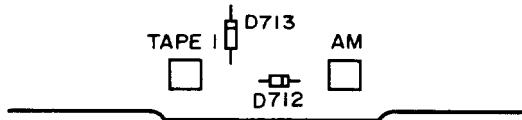
With the exception of the models below, a BAND STEP selector switch is not provided.  
 (FM)

MODEL	BAND STEP	D713	R122
UD	100kHz→50kHz	Additional	27kΩ→27kΩ
UG/UQ	50kHz→100kHz	Eliminated	27kΩ→13kΩ

(AM)

BAND STEP	D712
10kHz→9kHz	Additional
9kHz→10kHz	Eliminated

In D712 ISS133 (Part No. 223163) is used. In D713 US1040 (Part No. 223150) is used. R101, with the muting amplitude determined, is on the back panel side of the tuner circuit printed circuit board assembly test points TP-1 and TP-2. (Refer page 13)



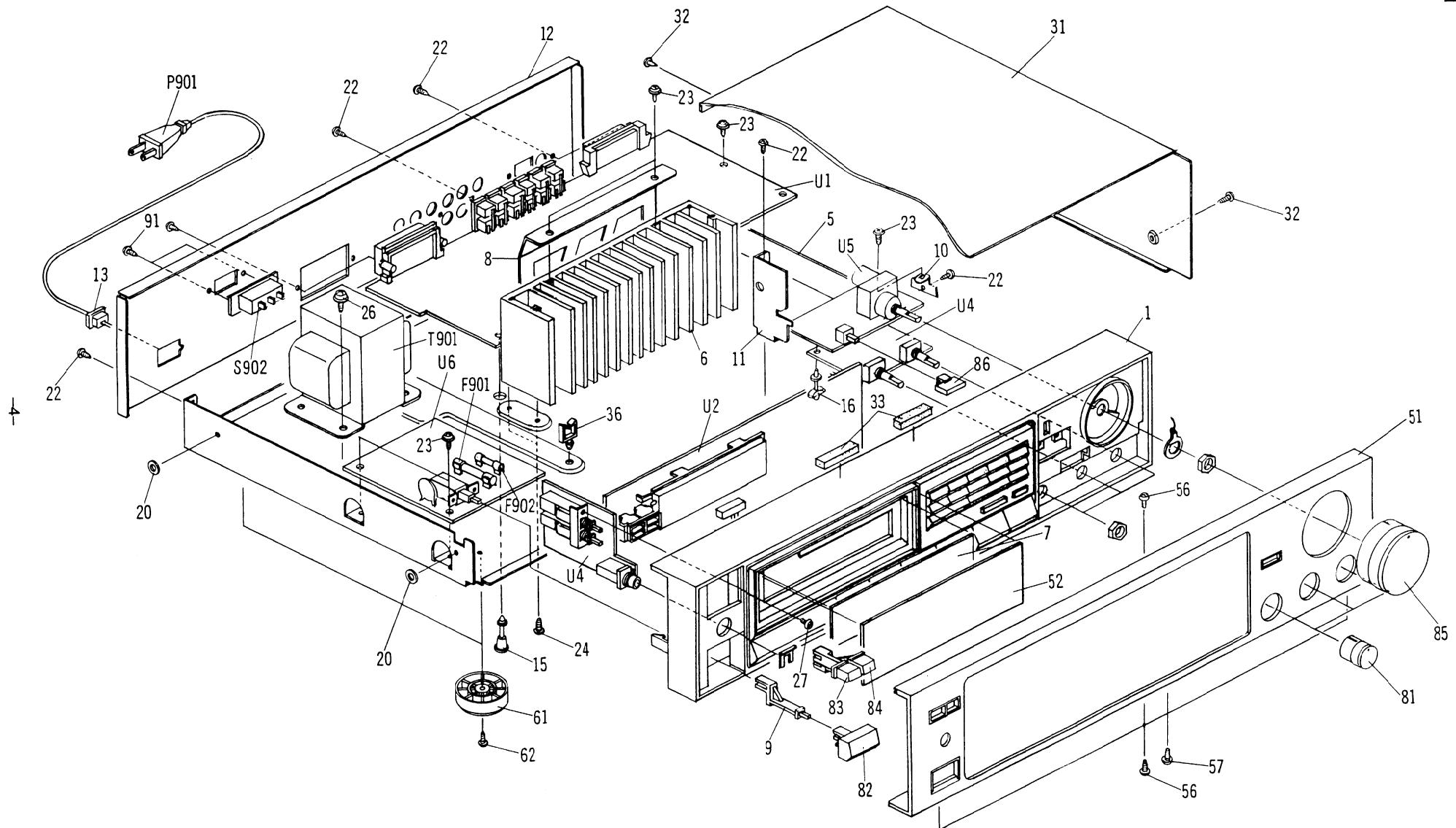
### 6.Memroy preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory, the power switch must be turned on and off a few times each month to keep the back-up system operative.

The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit.

On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

# **EXPLODED VIEW**



# PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	27110540Y	Front bracket ass'y	S902	25065123	⚠ NSS-1258P, Voltage selector switch <W>
5	27100187BY	Chassis	T901	2300519Y	⚠ NPT-1060D, Power transformer <D>
6	27160210Y	Radiator		2300507Y	⚠ NPT-1028GM, Power transformer <G>
7	28133240Y	Back plate		2300508Y	⚠ NPT-1028DGM, Power transformer <W>
8	27130574Y	Bracket, IC		2300509Y	⚠ NPT-1028QM, Power transformer <QA/QB>
9	27273116Y	Joint, POWER	U1	1A203558-3	NAAR-3558-3, Main circuit pc board ass'y <D>
10	27141330Y	Bracket, PC		1A203558-3A	NAAR-3558-3A, Main circuit pc board ass'y <G/QA/QB>
11	27130577Y	Bracket, SHIELD		1A203558-3B	NAAR-3558-3B, Main circuit pc board ass'y <W>
12	27121316Y	Back panel <D>	U2	1A203559-3	NADIS-3559-3, Display circuit pc board ass'y <D>
	27121316-1Y	Back panel <G>		1A203559-3A	NADIS-3559-3A, Display circuit pc board ass'y <G/QA/QB>
	27121316-3Y	Back panel <W>		1A203559-3B	NADIS-3559-3B, Display circuit pc board ass'y <W>
	27121264-4Y	Back panel <QA/QB>	U3	1A203560-3	NAAF-3560-3, Tone circuit pc board ass'y <D>
13	27300750	⚠ Bushing(Strainrelief)		1A203560-3A	NAAF-3560-3A, Tone circuit pc board ass'y <G/W/QA/QB>
15	27190524	KGLS-14R, Holder	U4	1A203561-3	NASW-3561-3, Speaker switch pc board ass'y <D>
16	27190503	KGLS-8R, Holder		1A203561-3A	NASW-3561-3A, Speaker switch pc board ass'y <G/W/QA/QB>
17	27270148	Spacer	U5	1A203562-3	NAETC-3562-3, Volume pc board ass'y
18	28141058	14×50×25, Cushion	U6	1A203563-3	NAPS-3563-3, Power supply circuit pc board ass'y <D>
20	27270212	Spacer		1A203563-3A	NAPS-3563-3A, Power supply circuit pc board ass'y <G/QA/QB>
22	834430088	3TTS+8B(BC), Tapping screw		1A203563-3B	NAPS-3563-3B, Power supply circuit pc board ass'y <G>
23	831130088	3TTW+8B, Tapping screw	F901	252049	⚠ 4A(ST-6), Fuse, primary <D/W>
26	830440089	4TTC+8C(BC), Tapping screw	F902	252074	⚠ 2A-SE-EAK, Fuse, primary <G/W/QA/QB>
27	82143006	3P+6FN(BC), Pan head screw	P901	253163	⚠ AS-UC-6#18, Power supply cord <D>
31	28184432Y	Top cover		253164	⚠ AS-CEE, Power supply cord <G/W>
32	834430088	3TTS+8B(BC), Tapping screw		253118	⚠ AS-SAA, Power supply cord <QA>
33	28140020Y	Cushion		2300413	⚠ Power supply cord <QB>
36	27300833	Clamp			
51	1A203121	Front panel ass'y			
52	28191504Y	Clear plate			
56	833430080	3TTP+8P(BC), Tapping screw			
57	834430088	3TTS+8B(BC), Tapping screw			
61	27175219CY	Leg			
62	834430088	3TTS+8B(BC), Tapping screw			
81	28323310AY	Knob, TONE			
82	28323241-1AY	Knob, POWER			
83	28323314Y	Knob, SPEAKER A			
84	28323316Y	Knob, SPEAKER B			
85	28323689	Knob, VOLUME			
86	28323638Y	Knob, LOUDNESS			
91	82143006	3P+6F(BC), Pan head screw <W>			
F901	252049	⚠ 4A(ST-6), Fuse, primary <D/W>			
F902	252074	⚠ 2A-SE-EAK, Fuse, primary <G/W/QA/QB>			
P901	253163	⚠ AS-UC-6#18, Power supply cord <D>			
	253164	⚠ AS-CEE, Power supply cord <G/W>			
	253118	⚠ AS-SAA, Power supply cord <QA>			
	2300413	⚠ Power supply cord <QB>			

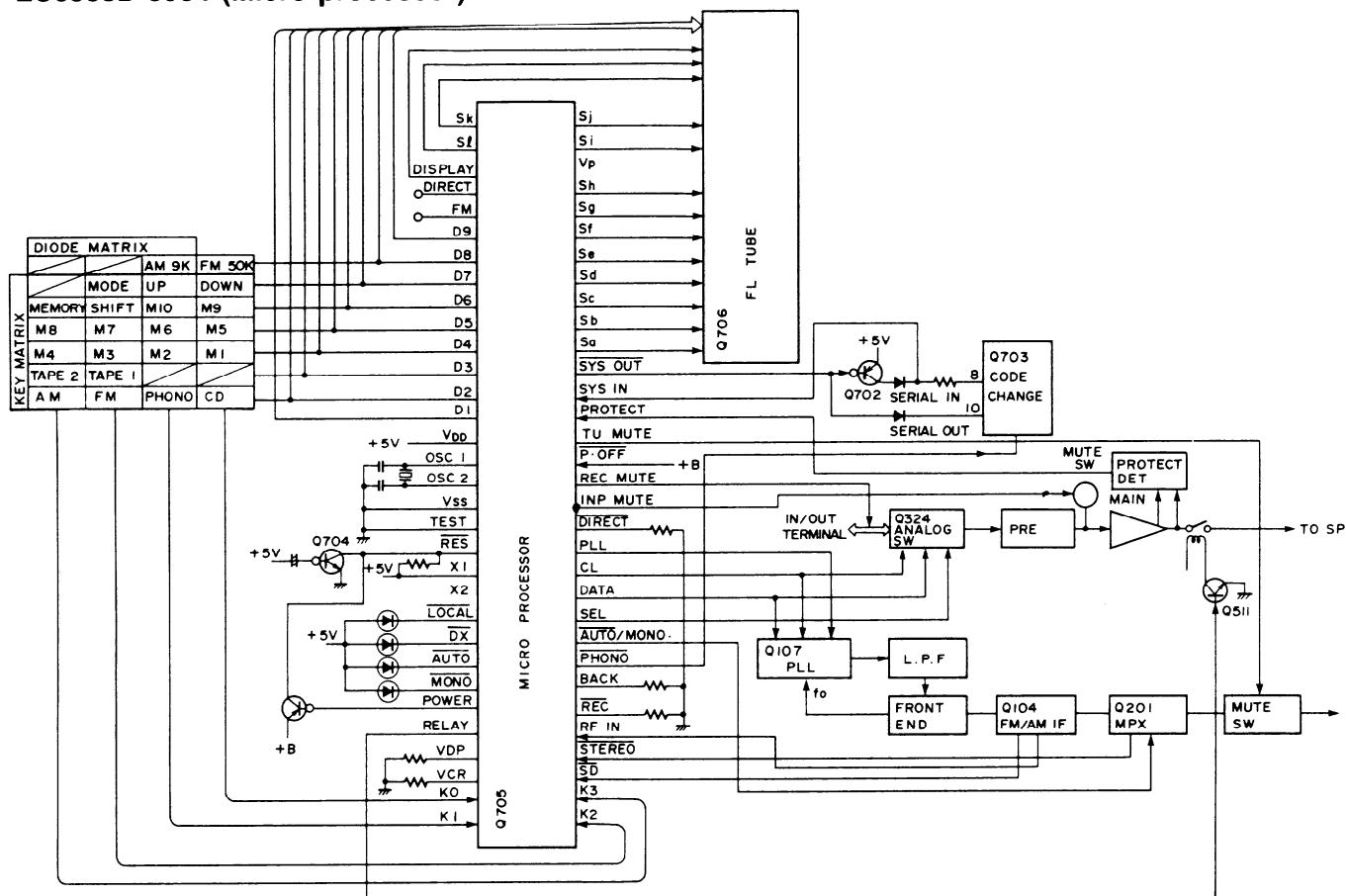
NOTE: <D> : Only 120V model  
 <G> : Only 220V model  
 <W> : Only Worldwide model  
 <QA> : Only Australian model  
 <QB> : Only U.K. model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

## IC BLOCK DIAGRAM AND DESCRIPTIONS

Q705

LC6538D-3984 (Micro processor)



Pin No.	Terminal	Descriptions
1	Sk	These are the output terminal for segment signal.
2	Si	"H" when active.
3	DISPLAY	This is the display control output terminal. "H" during FL tube lights on.
4	DIRECT	This is the direct indicator output terminal. Not used.
5	FM	This is FM control output terminal. Not used.
6	D9	
7	D8	
8	D7	
9	D6	These are the output terminal for digit and key scan signal.
10	D5	"H" when active.
11	D4	
12	D3	
13	D2	
14	D1	
15	V <sub>DD</sub>	This is the device power source terminal. At the time of operation, the supply is 5V. The internal data memory (RAM) is maintained by means of the super capacitor.
16	OSC1	This is the main system clock connection terminal.
17	OSC2	Connect to the 4.00MHz ceramic oscillator.
18	V <sub>SS</sub>	Ground terminal.
19	TEST	This is the test terminal for LSI. Connect to the ground terminal.
20	RES	This is the reset terminal. Reset at the low level when the power is turned on.
21	X1	These are the sub clock input terminal.
22	X2	Not used.
23	LOCAL	
24	DX	
25	AUTO	
26	MONO	These are the auto reception mode indicator output terminal. "L" when active.

Pin No.	Terminal	Descriptions
27	POWER	This is the power control output terminal. "H" when the power is turned on.
28	RELAY	This is the speaker protection relay control output terminal. "H" when active.
29 30	VDP VCR	These are the video signal control output terminal. Not used.
31 32 33 34	K0 K1 K2 K3	These are the key return signal input terminal. "H" when active.
35	SD	This is the auto stop input terminal. Auto tuning stops when this terminal becomes low level.
36	STEREO	This is the input terminal for detection of the stereo broadcast. "L" when stereo broadcast.
37	RF IN	This is IF signal level input terminal. DX mode when this terminal becomes the high level.
38 39	REC BACK	These are the mode setting input terminals.
40	PHONO	This is PHONO control output terminal. "L" when selector switch is PHONO.
41	AUTO/MONO	This is AUTO/MONO switching output terminal. "L" when AUTO.
42	SEL	Connect to terminal SEL of analog switch. (Q324 LC7821)
43	DATA	This is the serial data output terminal. Connect to terminal DATA of PLL IC (Q107 LM7001) and terminal DI of analog switch.
44	CLOCK	This is the serial clock output terminal. Connect to terminal CI of PLL IC and terminal DI of analog switch.
45	PLL	Connect to terminal CE of PLL IC.
46	DIRECT	This is the direct control output terminal. "L" when active.
47	INP MUTE	This is the muting output terminal for audio amplifier. "H" when the selector switch is operated.
48	REC MUTE	This is the muting output terminal for recording. "H" when the selector switch is operated.
49	P. OFF	This is the input terminal for detection of stoppage of electric current. "L" when the stoppage of electric current.
50	TU MUTE	This is the muting output terminal of tuner section. "H" when active.
51	PROTECT	This is the detection terminal for protection circuit. The speaker relay turns off when this terminal becomes the high level.
52	SYS IN	This is the system code input terminal. "H" when active.
53	SYS OUT	This is the system code output terminal. "L" when active.
54 55 56 57 58 59 60 61	Sa Sb Sc Sd Se Sf Sg Sh	These are the segment output terminal. "H" when active.
62	VP	This is the power supply terminal for pull-down resistor.
63 64	Si Sj	These are the segment output terminal. "H" when active.

### Key and diode matrix

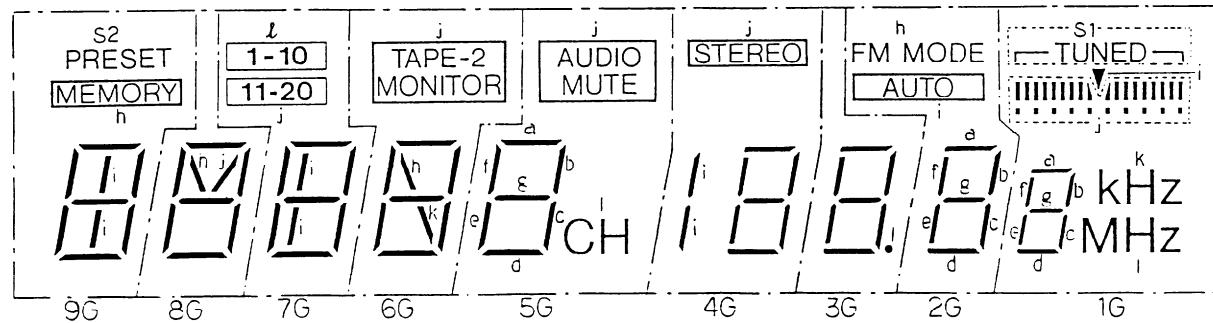
	D1(14)	D2(13)	D3(12)	D4(11)	D5(10)	D6( 9)	D7( 8)	D8( 7)	D9( 6)
K3(34)		AM	TAPE-2	M4	M8	MEMORY	DIRECT	PSET30	
K2(33)		FM	TAPE-1	M3	M7	SHIFT	FM MODE	EU1/2	
KI(32)		PHONO	VCR	M2	M6	M10	UP	AM9K	VKEY
K0(31)	POWER	CD	VDP	M1	M5	M9	DOWN	FM50K	PKEY
DIODE MATRIX									

**FM50K (FM band setting)**

FM50K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europen	87.50 ~ 108.00MHz	50kHz	25kHz	10.7MHz
0	U.S.A.	87.5 ~ 108.0MHz	100kHz	25kHz	10.7MHz

**AM9K (AM band setting)**

AM9K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europen	522 ~ 1611 kHz	9kHz	9kHz	450kHz
0	U.S.A.	530 ~ 1710 kHz	10kHz	10kHz	450kHz

**Q706****FIP9BDM8 (FL tube)****Terminal connection**

TERMINAL NO. ELECTRODE	1 F	2 F	3 NP	4 P (j)	5 9G	6 P (i)	7 8G	8 P (h)	9 P (g)	10 7G	11 P (f)	12 NP	13 6G	14 P (e)	15 P (d)	16 P (c)	17 5G	18 P (b)				
TERMINAL NO. ELECTRODE					19 P (a)	20 NP	21 4G	22 P (k)	23 P (l)	24 NP	25 3G	26 P (s2)	27 2G	28 P (s1)	29 1G	30 NP	31 NP	32 1G	33 NP	34 F	35 F	36

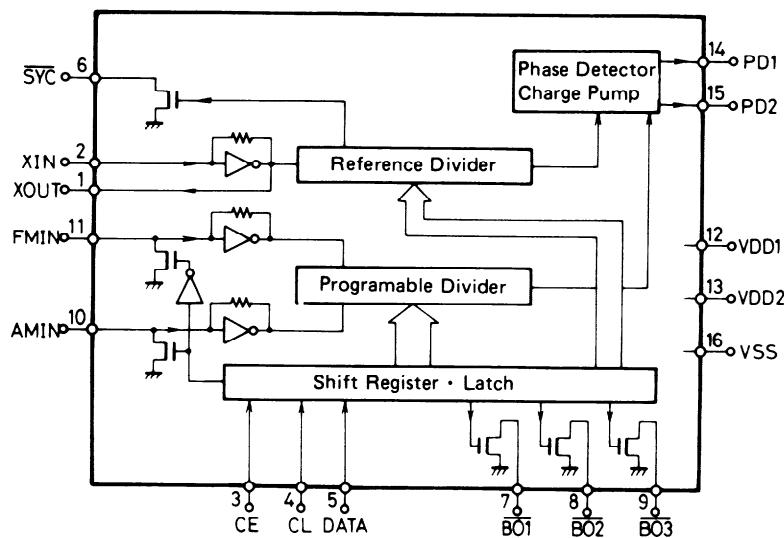
Notes    F: Filament                   NP: No Pin  
 G: Grid  
 P: Anode

**Connection of fluorescent tube and microporcessor**

	D9 (6)	D8 (7)	D7 (8)	D6 (9)	D5 (10)	D4 (11)	D3 (12)	D2 (13)	D1 (14)
Sa (54)	a	a	a	a	a	a	a	a	a
Sb (55)	b	b	b	b	b	b	b	b	b
Sc (56)	c	c	c	c	c	c	c	c	c
Sd (57)	d	d	d	d	d	d	d	d	d
Se (58)	e	e	e	e	e	e	e	e	e
Sf (59)	f	f	f	f	f	f	f	f	f
Sg (60)	g	g	g	g	g	g	g	g	g
Sh (61)	MEMORY	h	h	h				FM MODE	
Si (63)	i	i	i			/		AUTO	▼
Sj (64)	j	j	11-20	TAPE-2	MUTING	STEREO		MONO	
Sk (1)				k	k				kHz
Sl (2)	l		l-10		CH				MHz

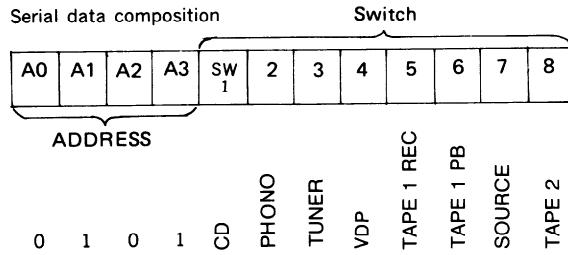
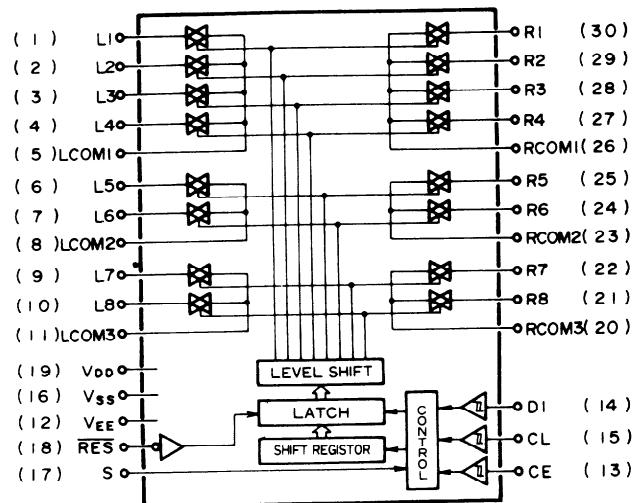
( ): Pin number of micro processor

**Q107**  
**LM7001 (PLL synthesizer and controller)**



Pin No.	Terminal	Description
1	XOUT	
2	XIN	Connect to the 7.2 MHz crystal oscillator.
3	CE	Chip enable terminal. Connect to the PLL terminal of micro processor.
4	CL	Serial clock input terminal. Connect to the CLOCK terminal of micro processor.
5	DATA	Serial data input terminal. Connect to the DATA terminal of micro processor.
6	SYN	Not used.
7	BO1	Not used.
8	BO2	FM control signal output terminal. "L" when FM.
9	BO3	AM control signal output terminal. "L" when AM.
10	AMIN	AM local oscillator input terminal.
11	FMIN	FM local oscillator terminal.
12	VDD 1	Power supply terminal for back-up.
13	VDD 2	Power supply terminal.
14	PD1	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters.
15	PD2	
16	Vss	Ground terminal.

**Q324**  
**LC7821 (Analog switch)**

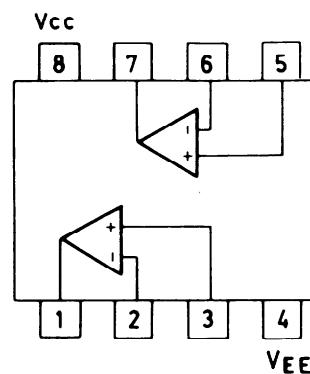


The source becomes ON when the bit of switch becomes the high level.

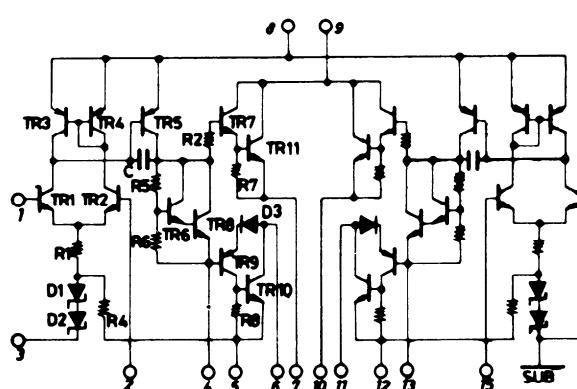
(Q312)

Pin No.	Terminal	Description	Pin No.	Terminal	Description
1	CD		16	Vss	Ground terminal.
2	—		17	S	Selector terminal.
3	PHONO		18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
4	TUNER		19	VDD	Power supply terminal. (+15V)
5	L COM 1		20	R COM 3	
6	VDP		21	—	
7	VCR PLAY		22	TAPE 1 PLAY	
8	L COM 2		23	R COM 2	
9	TAPE 1 PLAY		24	VCR PLAY	
10	—		25	VDP	
11	L COM 3		26	R COM 1	
12	Vee	Negative power supply terminal. (-15V)	27	TUNER	
13	CE	Chip enable terminal. Connect to SEL terminal of micro processor.	28	PHONO	
14	DI	Serial data input terminal. Connect to DATA terminal of micro processor.	29	—	
15	CL	Serial clock input terminal. Connect to CLOCK terminal of micro processor.	30	CD	

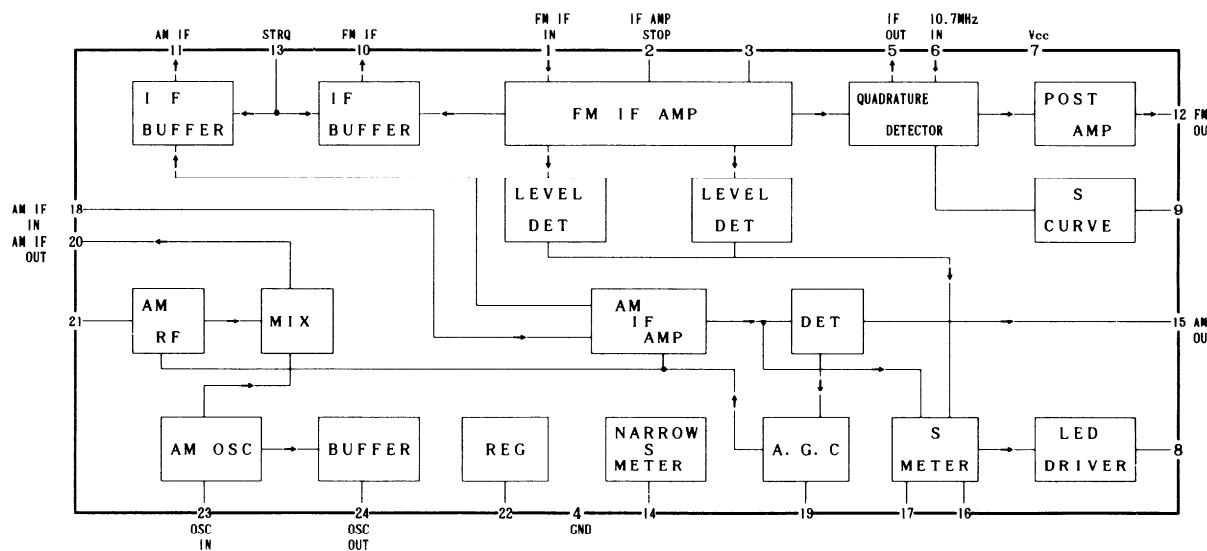
**Q301, Q401, Q402**  
**NJM4558D-X (Operation amplifier)**



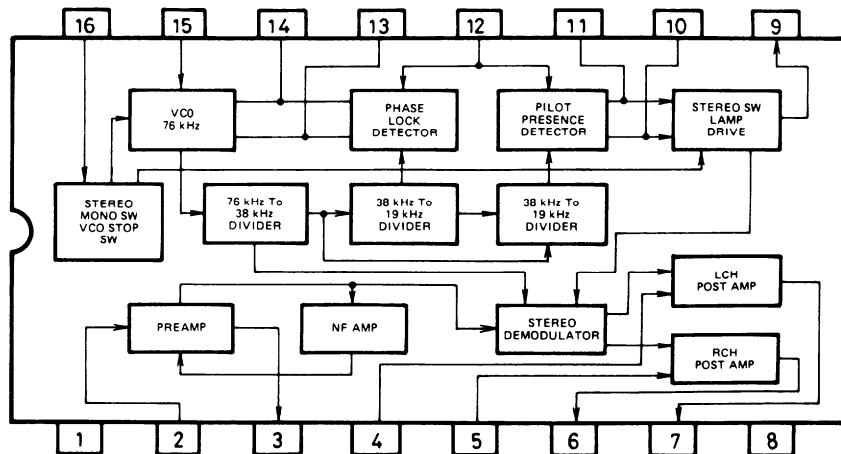
**Q501**  
**STK4171V / STK4151V (Power amplifier IC)**



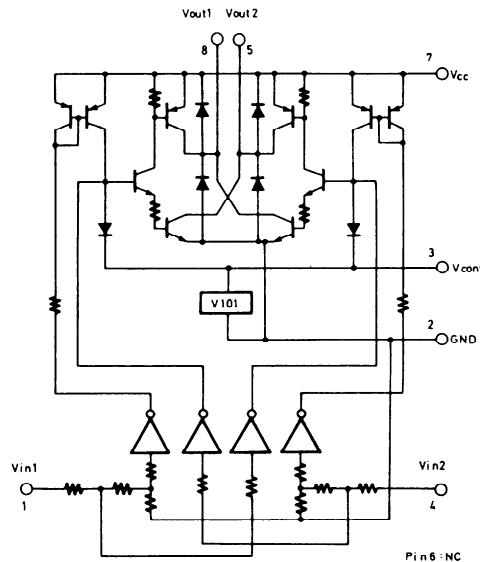
## **Q104 LA1266 (FM IF & AM radio system)**



## **Q201 AN7470 (Stereo decoder)**



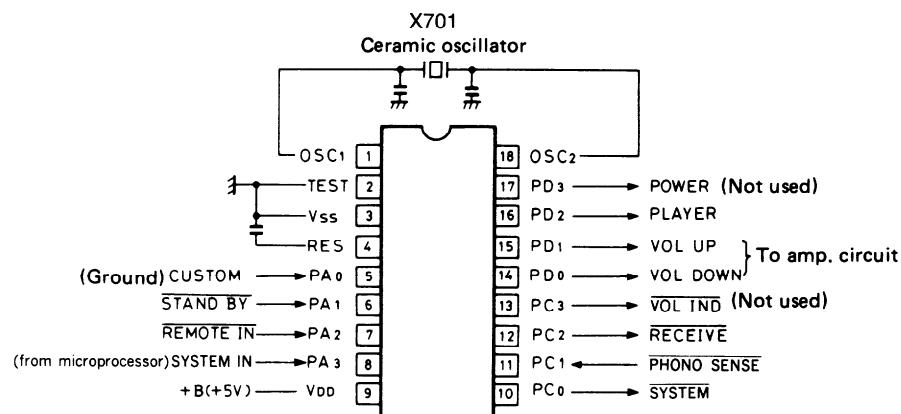
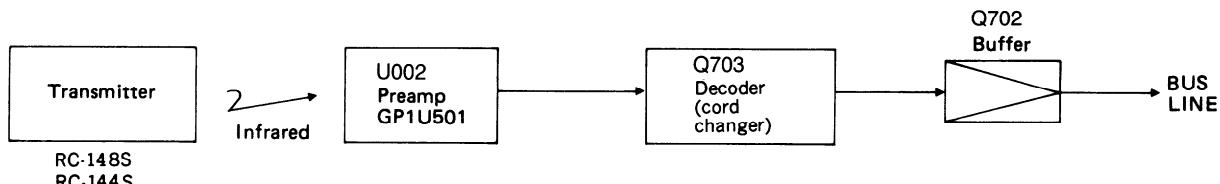
## **Q403 LB1630 (Motor driver)**



### TRUTH TABLE

IN 1	IN 2	OUT 1	OUT 2	MOTOR
H	L	H	L	Normal
L	H	L	H	Reverse
H	H	OFF	OFF	Wait
L	L	OFF	OFF	Wait

**Q703**  
**LC6527C-3987 (Remote controller)**



Connection diagram

Terminal No.	Symbol	Terminal	Description
1 18	OSC1 OSC2	OSC	Connect to the 4MHz ceramic oscillator.
2	TEST	TEST	Test terminal. Connect to the ground.
3	Vss	GND	Ground terminal.
4	RES	RES	Reset terminal.
5	PA0	CUSTOM	The custom code for decode is selected at this terminal. For this model, the level is low.
6	PA1	STANDBY	Terminal for STANDBY detection. During low input, only the POWER code is decoded.
7	PA2	REMOTE IN	Signal input terminal from remote control preamp. Active low.
8	PA3	SYSTEM IN	System code input terminal. Active high.
9	V <sub>DD</sub>	+B(5V)	Power supply terminal.
10	PC0	SYSTEM OUT	Output at this terminal are the custom code remote control code input to REMOTE IN, the system code that has been converted corresponding to the decoded data code.
11	PC1	PH SENS	Phono detection input terminal. Active low.
12	PC2	RECEIVE	This is the display output for remote control reception. Output is low when decoded code is being received.
13	PC3	VOLIND	During output of VOLUME UP/DOWN, a pulse ( $\overline{J} \overline{T} \overline{T} \overline{T}$ ; $T=250ms$ ) is output.
14	PD0	VOL DOWN	When the volume DOWN code is input, a high pulse of 120ms is output.
15	PD1	VOL UP	When the volume UP code is input, a high pulse of 120ms is output.
16	PD2	PLAYER	Player control output terminal.
17	PD3	POWER	The power code input inverts the L/H. Level is high for power being turned ON.

## ADJUSTMENT PROCEDURES

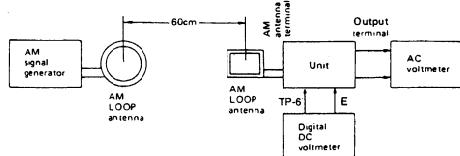
### FM section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuned frequency	Output indicator	Adjustment point	Adjust for	Remarks
I F	1	Fig. 1	99.1MHz 1kHz, 75kHz devi. 55dBf(60dB)	—	99.1MHz	DC voltmeter	L101	0 ± 20mV	Set the FM mode switch to MONO. Repeat the steps 1 and 2 until no further adjustment is necessary.
	2					Distortion analyzer	L102	Minimum	
V C O		Fig. 2	99.1MHz 1kHz, 75kHz devi. 55dBf(60dB)	—	99.1MHz	Frequency counter	R201	19kHz ± 10Hz	Set the FM mode switch to AUTO.
Stereo distortion		Fig. 3	99.1MHz Ext. modulation 55dBf(60dB)	L+R 1kHz 67.5kHz devi.	99.1MHz	Distortion analyzer	IF on front end	Minimum	
Stereo separation	1	Fig. 3	99.1MHz Ext. modulation 55dBf(60dB)	Lch. 1kHz	99.1MHz	Rch. AC voltmeter	R202	Minimum	Maximum and same separation
	2			Rch. 1kHz		Lch. AC voltmeter		Minimum	
Tuned indicator level	1	Fig. 3	99.1MHz 1kHz, 75kHz devi. 19.2dBf(14dB)(120V model) 12dB (other models)	—	99.1MHz	TUNED indicator	R101	Light on	
	2							Light off	

### AM section

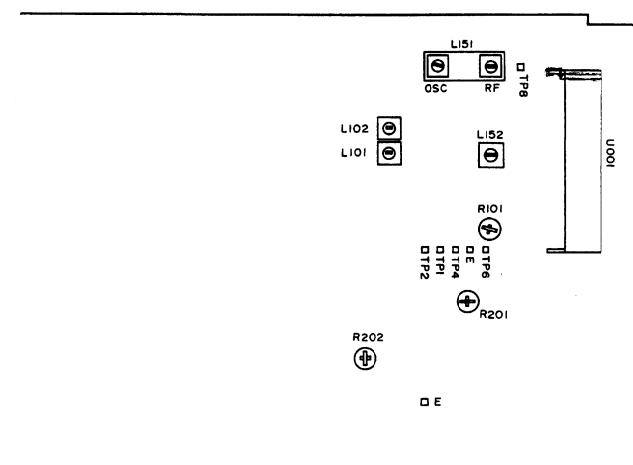
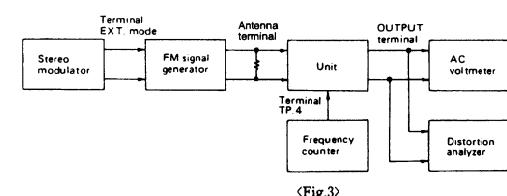
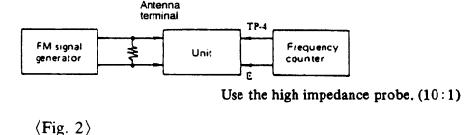
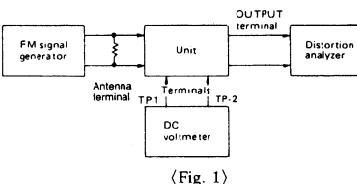
Step	AM SG output	Tuned Frequency	Output indicator	Adjustment point	Adjust for
1	—	522kHz (530kHz) (531kHz)	Digital DC voltmeter	OSC coil on RF block (L151)	1.5V ± 0.1V
2	603kHz, 50dB/m (600kHz) 400Hz 30% mod.	603kHz (600kHz)	A C voltmeter	RF coil on RF block (L151)	Maximum
3	990kHz, 60dB/m 400Hz 30% mod.	990kHz	A C voltmeter	L152	Maximum

Note: ( ) :120V model (10kHz step)  
< >: Worldwide model



### Reference specifications

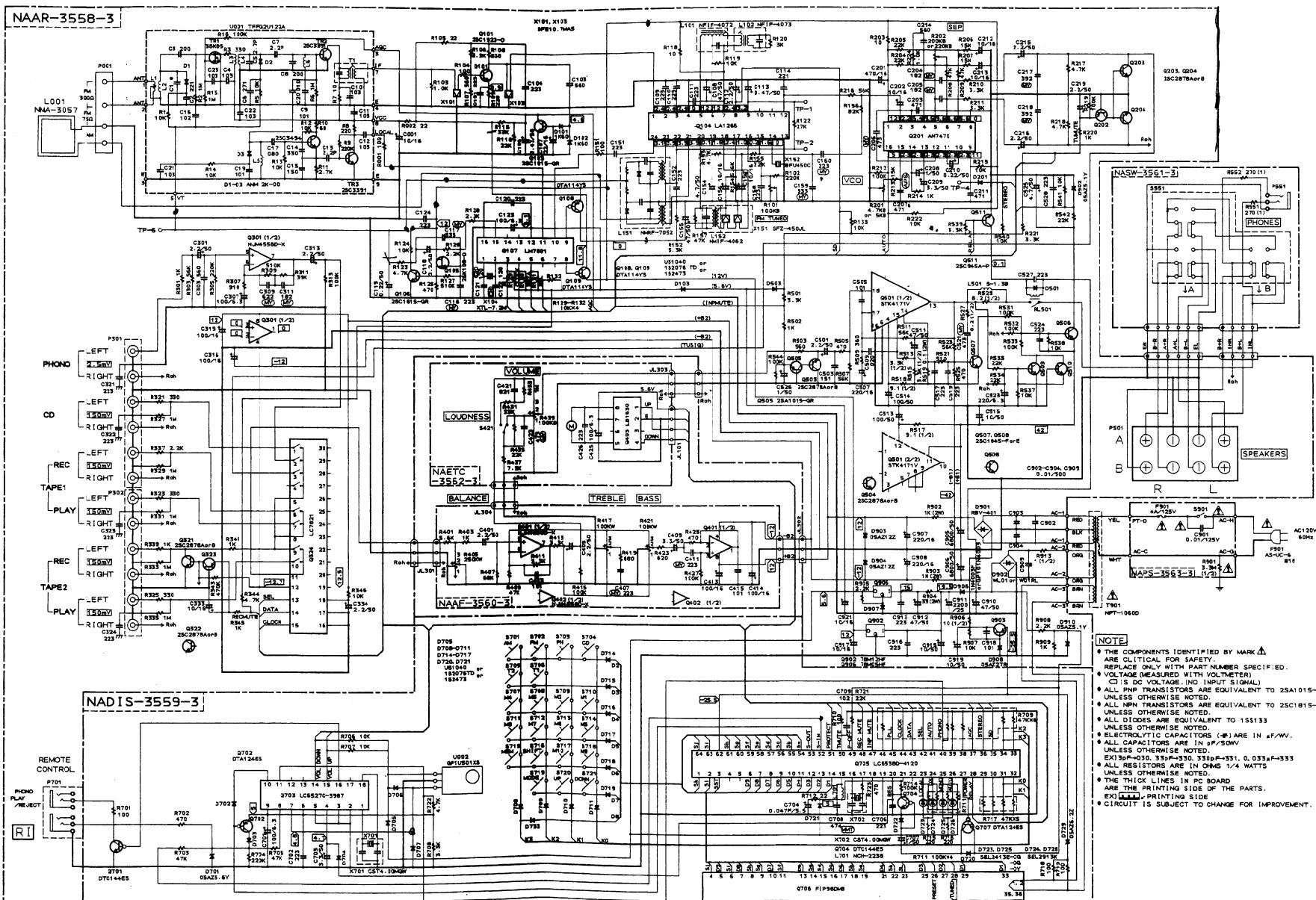
Tuned voltage (Comnet Digital test point TP-6)	AM 530kHz (U.S.A. model) 522kHz (European model)	1.5 ± 0.4V
DC voltmeter to	1710kHz (U.S.A. model)	8.0 ± 0.5V
	1611kHz (Europe in model)	7.5 ± 0.5V
FM	87.9MHz (U.S.A. model) 87.50MHz (European model)	2.0 ± 0.5V
	108.0MHz (U.S.A. model) 108.0MHz (European model)	7.5 ± 0.5V
Muting width	(U.S.A. model) (European model)	65 ± 15kHz 35 ± 10kHz
Muting level	(U.S.A. model) (European model)	FM 14 ± 13dB FM 12 ± 3dB
Auto stop level	AM	Less than 72dB/m
Stereo indicator level	FM	Less than 20dB $\mu$
		14 ± 4dB $\mu$



1                          2                          3                          4                          5                          6                          7

## **SCHEMATIC DIAGRAM**

**— 120V MODEL —**



**ONKYO CORPORATION**

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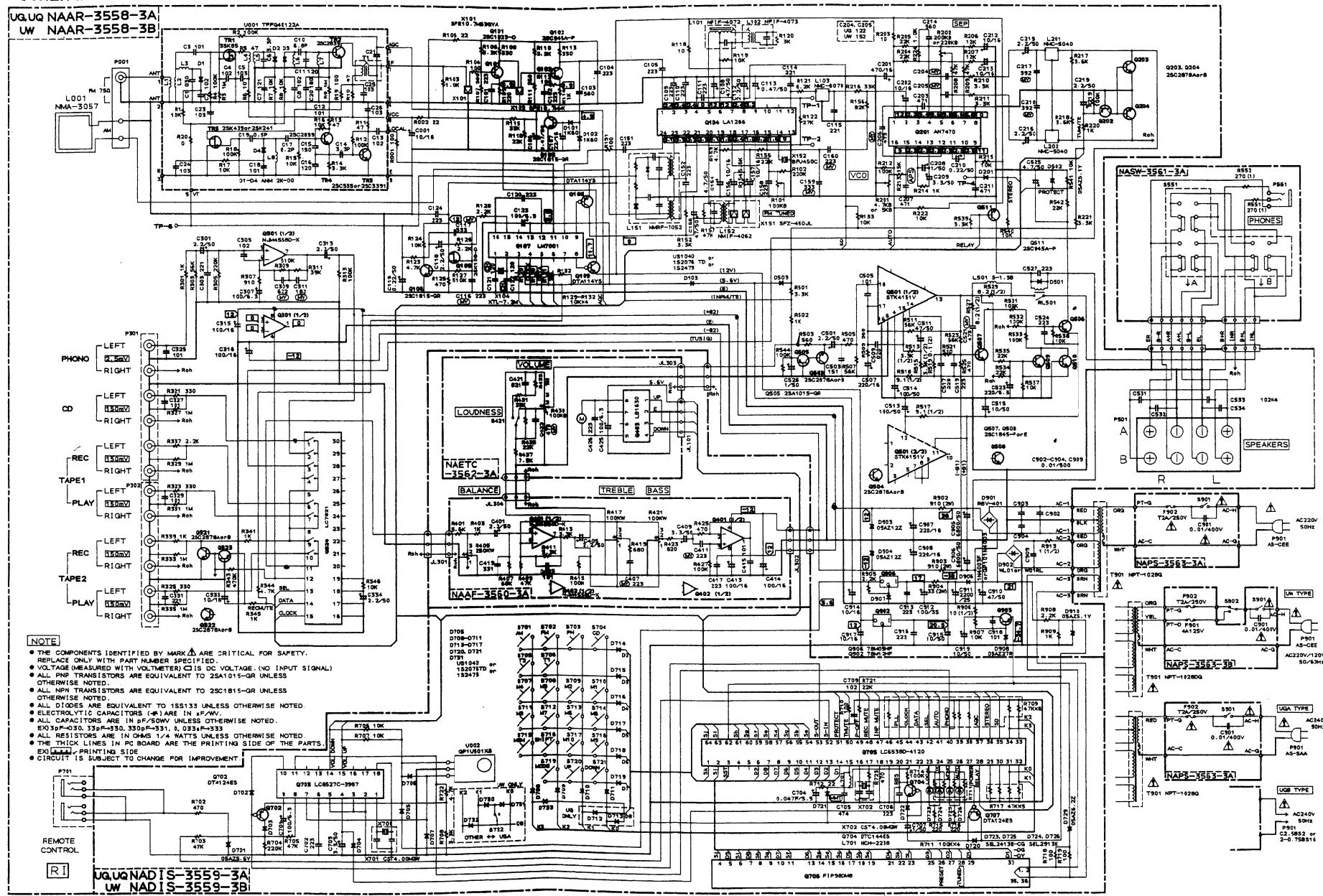
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## **SCHEMATIC DIAGRAM**

#### **— OTHER MODELS —**



# PRINTED CIRCUIT BOARD PARTS LIST

## MAIN CIRCUIT PC BOARD (NAAR-3558-3/3A/3B)

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
		<b>Front end</b>			<b>Ceramic filters</b>
U001	240084	TFFG2U122A <D>	X101, X103	3010071	SFE10.7MA5 <D>
	240085	TFFG4E122A <G/W>	X101	3010070	SFE10.7MS3GYA <G/W>
		<b>ICs</b>	X102	3010137	SFE10.7MMK <G/W>
Q104	22240039	LA1266	X151	3010123	SFZ450JL
Q107	22240090	LM7001	X152	3010076	BFU450C
Q201	22240242	AN7470			<b>X'tal</b>
Q301	222502	NJM4558D-X	X104	3010158Y	XTL-7.2M
Q324	22240079	LC7821			<b>Capacitors</b>
Q501	222083Y	STK4171V <D>	C001	354741009	10μF, 16V, Elect.
	222044	STK4151V <G/W>	C106	354784799	0.47μF, 50V, Elect.
Q902	222780125	78M12HF	C107	354742209	22μF, 16V, Elect.
Q906	222780055	78M05HF	C108	354784709	47μF, 50V, Elect.
		<b>Transistors</b>	C112	354780229	2.2 μF, 50V, Elect.
Q101	2211723	2SC1923-O	C113	354784799	0.47μF, 50V, Elect.
Q102	2210746	2SC945A-P <G/W>	C116	371122234	0.022 μF ±5%, 50V, Mylar
Q103	2211255	2SC1815-GR	C117	371123334	0.033 μF ±5%, 50V, Mylar
Q105	2212294	2SK108-D	C118	354780229	2.2 μF, 50V, Elect.
Q106	2211255	2SC1815-GR	C119	354782299	0.22μF, 50V, Elect.
Q108, Q109	2213090	DTA114YS	C123	354721019	100 μF, 6.3V, Elect.
Q202, Q323	2211455	2SA1015-GR	C154	354780479	4.7 μF, 50V, Elect.
Q203, Q204	2212285 or	2SC2878-A or	C155	354784709	47μF, 50V, Elect.
Q321, Q322	2212286	2SC2878-B	C156, C157	354741009	10μF, 16V, Elect.
Q503, Q504	2212285 or	2SC2878-A or	C159	371123334	0.033 μF ±5%, 50V, Mylar
	2212286	2SC2878-B	C160	371122234	0.022 μF ±5%, 50V, Mylar
Q505, Q506	2211455	2SA1015-GR	C201	354744719	470 μF, 16V, Elect.
Q507, Q508	2211732 or	2SC1845-F or	C202	354741009	10μF, 16V, Elect.
	2211733	2SC1845-E	C204, C205	371121824	1800 pF±5%, 50V, Mylar <D>
Q509, Q510	2211255	2SC1815-GR		371121224	1200 pF±5%, 50V, Mylar <G>
Q511	2210746	2SC945A-P		371121524	1500 pF±5%, 50V, Mylar <W>
Q903	2211455	2SA1015-GR	C206	371124734	0.047 μF ±5%, 50V, Mylar
		<b>Diodes</b>	C207	370134714	470pF ±5%, 100V, APS
D101, D102	223132	1K60	C208	354780109	1 μF, 50V, Elect.
D103	223150,	US1040,	C209	354780339	3.3 μF, 50V, Elect.
	223145 or	1S2076TD or	C210	354782299	0.22μF, 50V, Elect.
	223124	1S2473	C212, C213	354741009	10μF, 16V, Elect.
D201, D501	223163	ISS133	C215, C216	354780229	2.2 μF, 50V, Elect.
D502	224150512	05AZ5.1Y	C217, C218	371123924	3900pF±5%, 50V, Mylar
D503	223163	ISS133	C219	354780229	2.2 μF, 50V, Elect.
D901	22380023	RBV401	C301, C302	354780229	2.2 μF, 50V, Elect.
D902	223862 or	WL01 or	C307, C308	354721019	100 μF, 6.3V, Elect.
	223890	W01RL	C309, C310	371126224	6200pF±5%, 50V, Mylar
D903, D904	224151203	05AZ12Z	C311, C312	371121824	1800pF±5%, 50V, Mylar
D906	223880 or	GP101N4003 or	C313, C314	354780229	2.2 μF, 50V, Elect.
	223896	1N4003F	C315, C316	354741019	100 μF, 16V, Elect.
D907	223163	ISS133	C333	354741009	10μF, 16V, Elect.
D908	224152704	05AZ27R	C334	354780229	2.2 μF, 50V, Elect.
D910	224150512	05AZ5.1Y	C501, C502	354780229	2.2 μF, 50V, Elect.
		<b>Transformers</b>	C507, C508	354742219	220 μF, 16V, Elect.
L101	233401	NFIF-4072	C511, C512	354784709	47μF, 50V, Elect.
L102	233402	NFIF-4073	C513, C514	354781019	100 μF, 50V, Elect.
L152	232139	NMIF-4062	C515	354781009	10μF, 50V, Elect.
		<b>Coils</b>	C521, C522	371124734	0.047 μF ±5%, 50V, Mylar
L103	233383	NMC-6070 <G/W>	C523	354722219	220 μF, 6.3V, Elect.
L201, L202	233294	NMC-5040 <G/W>	C525	354780479	4.7 μF, 50V, Elect.
L501, L502	231001	S-1.3B	C526	354780109	1 μF, 50V, Elect.
		<b>RF block</b>	C905, C906	3504207	6800μF, 50V, Elect.
L151	232152	NMRF-7052	C907, C908	354742219	220 μF, 16V, Elect.
			C910, C912	354784709	47μF, 50V, Elect.
			C911	354752229	2200μF, 25V, Elect.
			C915, C919	354781009	10μF, 50V, Elect.
			C917, C921	354741009	10μF, 16V, Elect.
					<b>Resistors</b>
			R101	5210070 or	N06HR 100KBD
				5210221	Semi-fixed

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
R201	5210062 or 5210216	N06HR4.7KBD or N06HR5KBD, Semi-fixed	X701, X702	3010150	CST4.00MGW
R202	5210072 or 5210222	N06HR220KBD or N06HR200KBD, Semi-fixed	L701	<b>Coil</b> 233400K220 or 233409K220	NCH-2238 or NCH-1284
R513-R516	442523324	3.3kohm, 1/2W, Metal oxide film		<b>Capacitors</b>	
R517, R518	442520914	9.1ohm, 1/2W, Metal oxide film	C701	354721019	100 $\mu$ F, 6.3V, Elect.
R519, R520	4500001	BPR2FK-0.1, Metal plate	C703	354780339	3.3 $\mu$ F, 50V, Elect.
R527-R530	442520824	8.2ohm, 1/2W, Metal oxide film	C704	3000051	0.047F, 5.5V, Super
R902, R903	441721024 441729114	1kohm, 2W, Metal oxide film <D> 910ohm, 2W, Metal oxide film <G/W>	C707	353780109	1 $\mu$ F, 50V, Elect.
R904	441723304	33ohm, 2W, Metal oxide film	C708	375524744	0.47 $\mu$ F $\pm$ 5%, 50V, Plastic (MMT)
R906	442521004	10ohm, 1/2W, Metal oxide film		<b>Resistors</b>	
R913	442520104	1ohm, 1/2W, Metal oxide film	R709	49163473406	47kohm $\times$ 6, 1/10W, Network
	<b>Terminals</b>		R711	49163104404	100kohm $\times$ 4, 1/10W, Network
P001	25060085	NTM-4PDMN29, Antenna <D>	R717	49163473404	47kohm $\times$ 4, 1/10W, Network
	25060087	NTM-2PDMN31, Antenna <G/W>		<b>Switches</b>	
P501	25060093	NTM-8PDML34, Speaker	S701-S721	25035548	NPS-111-S510
P301	25045252	NPJ-6PDBL124	S722	25065286	NSS-22112, Slide, band <W>
P302	25045213	NPJ-6PDBL92		<b>Holder</b>	
	<b>Jack</b>			27190700	L.E.D
P701	25045172	HSJ1003-01-020			
	<b>Relay</b>				
RL501	25065339	NRL-2P5A-DC24-046			

**DISPLAY CIRCUIT PC BOARD (NADIS-3559-3/3A/3B)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>Remote control sensor</b>	
U002	24130003	GP1U501XS
	<b>ICs</b>	
Q703	22240243	LC6527C-3987
Q705	22240319	LC6538D-4297
	<b>Transistors</b>	
Q701	221282	DTC144ES <D>
Q702, Q707	2212600	DTA124ES
Q704	221282	DTC144ES
	<b>FL tube</b>	
Q706	212075	FIP9BDM8
	<b>Diodes</b>	
D701	224150562 or 224450562	05AZ5.6Y or MTZ5.6B
D702-D704	223163	ISS133
D705	223150,	US1040,
D708-D711	223145 or	1S2076TD or
D714-D717	223124	1S2473
D712	223163	1SS133 <G>
D713	223150, 223145 or 223124	US1040, 1S2076TD or 1S2473 <G>
D706, D707	223163	ISS133
D718-D720	223163	ISS133
D721	223150, 223145 or 223124	US1040, 1S2076TD or 1S2473
D722, D733	223163	ISS133
D729	224150623	05AZ6.2Z
D730, D732	223163	1SS133 <W>
D731	223150, 223145 or 223124	US1040, 1S2076TD or 1S2473 <W>
	<b>L.E.Ds</b>	
D723, D725	225137CG, 225137DG or 225137DY	SEL2413E-CG, SEL2413E-DG or SEL2413E-DY
D724, D726	225142	SEL2913K

**TONE CIRCUIT PC BOARD (NAAF-3560-3/3A)**

CIRCUIT NO.	PART NO.	DESCRIPTION
	<b>ICs</b>	
Q401, Q402	222502	NJM4558D-X
	<b>Capacitors</b>	
C401, C402	354780229	2.2 $\mu$ F, 50V, Elect.
C405, C406	354780229	2.2 $\mu$ F, 50V, Elect.
C407, C408	371122234	0.022 $\mu$ F $\pm$ 5%, 50V, Mylar
C409, C410	354780339	3.3 $\mu$ F, 50V, Elect.
C411, C412	371122234	0.022 $\mu$ F $\pm$ 5%, 50V, Mylar
C413, C414	354741019	100 $\mu$ F, 16V, Elect.
	<b>Resistors</b>	
R405	5104225	N11RGL250KWT22Z, Variable, Balance
R417	5104230	N14RLC100KWT22Z, Variable, Treble
R421	5104230	N14RLC100KWT22Z, Variable, Bass
	<b>Socket</b>	
JL304a	25050267	NSCT-3P95

**SPEAKER SWITCH PC BOARD (NASW-3561-3/3A)**

CIRCUIT NO.	PART NO.	DESCRIPTION
R551, R552	441622714	270ohm, 1W, Metal oxide film resistors
S551	25035610	NPS-122-142-L572, Speaker switch
P551	25045256	YKB21-5010, Headphone jack <D>
		YKB21-5009, Headphone jack <G/W>

**VOLUME PC BOARD (NAETC-3562-3)**

CIRCUIT NO.	PART NO.	DESCRIPTION
Q403	222963	LB1630, IC
C423, C424	371124734	0.047 $\mu$ F $\pm$ 5%, 50V, Mylar capacitors

# PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

## POWER SUPPLY PC BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
C425	354721019	100 $\mu$ F, 6.3V, Elect. capacitor
R439	5104243	N16RGM100KBTP25F, Variable resistor, Volume
S421	25035609	NPS-122-L571, Push switch, Loudness

## POWER SUPPLY CIRCUIT PC BOARD (NAPS-3563-3/3A/3B)

CIRCUIT NO.	PART NO.	DESCRIPTION
C901	3500065A	$\triangle$ DE7150FZ103P AC400V/125V, Capacitor IS
R901	27301216 431523355	$\triangle$ SB1925, Cover for C901 <G/W> $\triangle$ 3.3Mohm, 1/2W, Solid resistor <D>

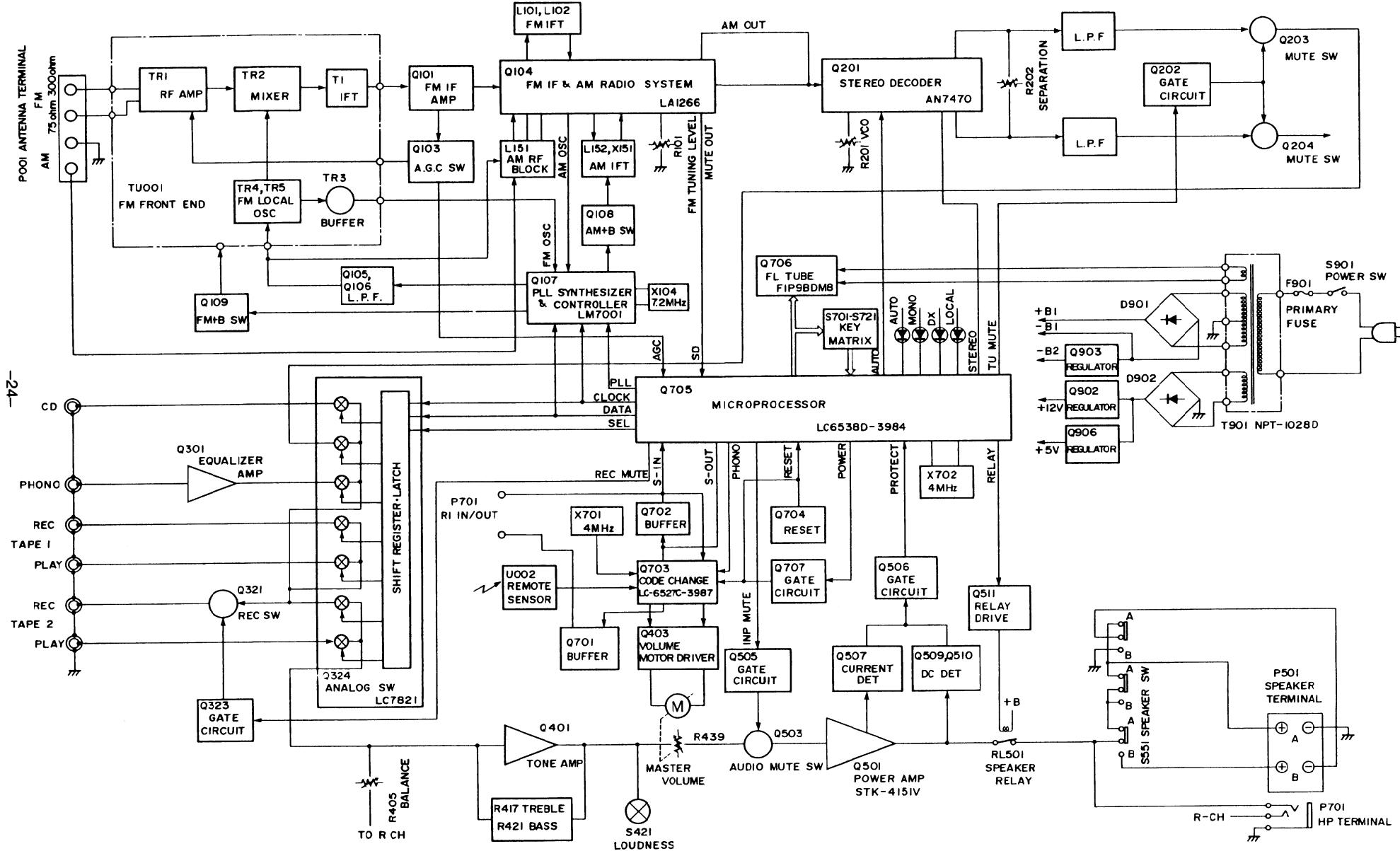
NOTE: THE COMPONENTS IDENTIFIED BY MARK  $\triangle$   
ARE CRITICAL FOR RISK OF FIRE AND  
ELECTRIC SHOCK. REPLACE ONLY WITH  
PART NUMBERS SPECIFIED.

CIRCUIT NO.	PART NO.	DESCRIPTION
S901	25035550	$\triangle$ NPS-111-L512P, Power switch
F901a	250113	$\triangle$ SN5051, Fuseholder <D/W>
F902a	25050065	$\triangle$ YSH4037, Fuseholder <G/W>
F901	252049	$\triangle$ 4A(ST-6), Fuse, primary <D/W>
F902	252074	$\triangle$ 2A-SE-EAK, Fuse, primary <G/W>
	29360626-1	$\triangle$ Label, fuse <D>

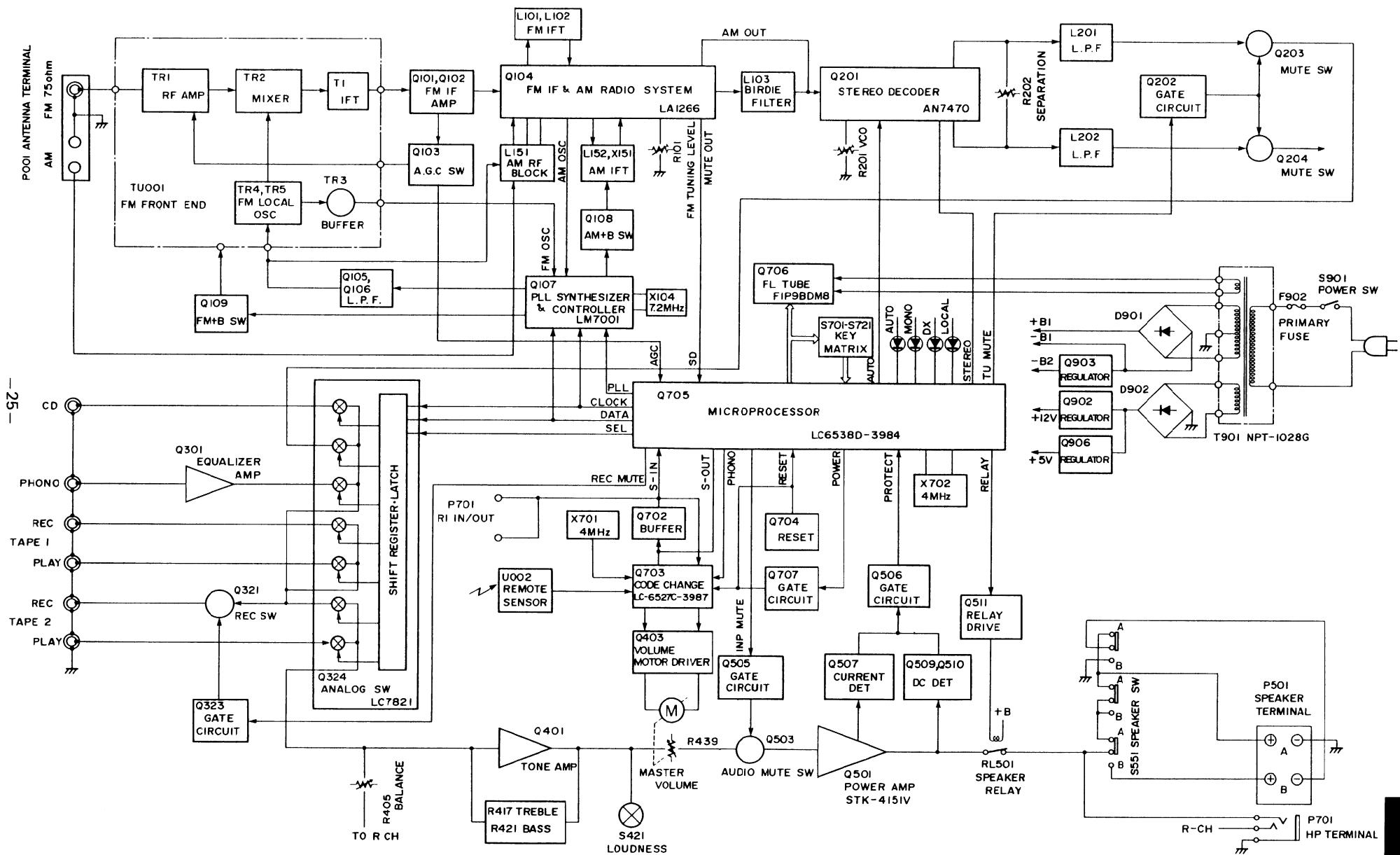
NOTE: <D> : Only 120V model  
<G> : Only 220V/240V models  
<W> : Only Worldwide model

# BLOCK DIAGRAM

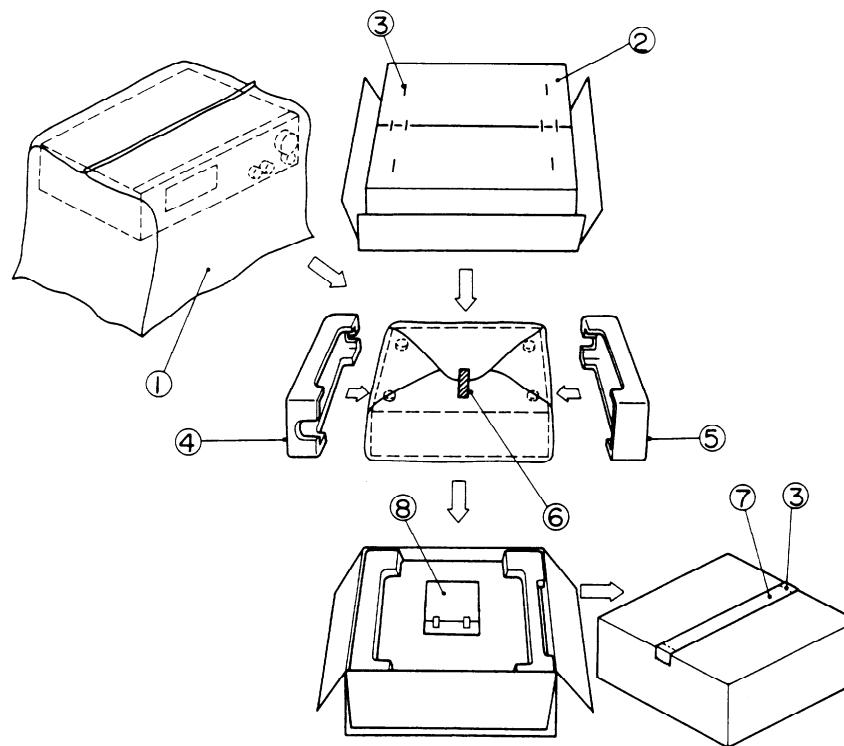
— 120V MODEL —



## — OTHER MODELS —



## PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION	
1	29100034AY	850 × 650mm, Poly-vinyl bag	<b>-220V/240V models-</b>
2	29052019Y	Master carton box	29341488Y Instruction manual
3	282301	Sealing hook	292092 FM antenna
4	29091328BY	Pad R	232140 NMA-3057, AM loop antenna
5	29091327BY	Pad L	2010169 Connection cord for RI
6	261504	Adhesive tape	3010054 UM-3, Two batteries
7	260012	Damplon tape	24140148 RC-148S, Remote control transmitter
8	Accessory bag ass'y		29100097Y 250 × 350mm, Poly-vinyl bag
	<b>-120V model-</b>		25060123 FM adaptor (240V model)
	29341487Y	Instruction manual	<b>-Worldwide model-</b>
	292064B	FM antenna	2934188Y Instruction manual
	232140	NMA-3057, AM loop antenna	292092 FM antenna
	2010169	Connection cord for RI	232140 NMA-3057, AM loop antenna
	3010054	UM-3, Two batteries	2010169 Connection cord for RI
	24140144A	RC-144S, Remote control transmitter	3010054 UM-3, Two batteries
	29100097Y	250 × 350mm, Poly-vinyl bag	24140148 RC-148S, Remote control transmitter
	29365019Y	Warranty card (U.S.A. model)	29100097Y 250 × 350mm, Poly-vinyl bag
	29358002GY	Service station list (U.S.A. model)	25060123 FM adaptor
	29341488Y	Instruction manual (Only Canadian model)	25055040 CV-K-2, Conversion plug

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